

Mercedes Benz Om470la Om471la Engine

Full download: <http://manualplace.com/download/mercedes-benz-om470la-om471la-engine/>

Mercedes-Benz OM470LA

Mercedes-Benz OM471LA

CLAAS

Repair manual



Service & Parts

This is the cut pages sample. Download all 504 page(s) at: ManualPlace.com

Table of contents

Introduction

General Information.....	4
General repair instructions.....	8
Torque settings.....	21

CCN explanation

CCN (CLAAS Component Number).....	33
-----------------------------------	----

CCN (CLAAS Component Number)

Safety

General Information.....	37
--------------------------	----

01 Engine

0102 Complete component.....	49
0105 Engine suspension.....	75
0110 Engine housing.....	78
0115 Engine unit.....	119
0120 Cylinder head / Valves / Idler gear.....	170
0125 Injection - / Fuel system.....	265
0130 Lubricating oil system.....	333
0135 Cooling system.....	355
0140 Exhaust system.....	366
0145 Air intake.....	432
0150 Engine attachment parts.....	451
0155 Engine control.....	475
0165 Exhaust gas aftertreatment.....	478

Index.....	493
------------	-----

Introduction

General Information

175821-001

Validity of manual

This manual applies to the Mercedes-Benz diesel engines below:

Engine	Type design	Engine no.
OM 470 LA	470.907	470.907-C-xxxxxx
OM 471 LA	471.919	471.919-C-xxxxxx
OM 473 LA	473.905	473.905-C-xxxxxx

123139-005

Handling the manual

This repair manual should help you to maintain ongoing operational capacity. The high value of the harvesting machine is ensured through careful maintenance and technical monitoring by customer service.

This repair manual is a compilation of our service technicians' and shop-floor experience.

The picture sequence demonstrates the steps in a repair procedure. The text provides you with the information required for making adjustments, using special tools and further similar information.

Essential repairs are listed in such a way that even individual and small repairs can be easily found and followed.

Supplements are added to reflect the ongoing technical development of the machines and the manual is thereby continuously being updated as a reference book.

As a precaution, always compare the setting values and fill quantities with the most recent operator's manual and the technical systems documents for the respective machine.

Texts and figures





Pictures and graphics apply to all models covered by this manual. Differences are highlighted by captions below the figures.

In general, texts are short and apply to all models covered by this manual. Differences are highlighted by intermediate headings.

Different text categories can be easily identified by the formatting. The following different formatings are distinguished:

Formatting	Meaning	Description
Description	Descriptive text	Further information on the subject.
– Procedure instructions	Process	Operations which must be carried out one after the other.
<i>Result</i>	Result	Result of the processes carried out.

References can be easily identified by corresponding symbols. The following symbols are distinguished:

Symbol	Meaning	Description
	See index	The  symbol indicates that further information on this subject is available in other sections of this manual.
	See the index of the Operator's Manual in question	The  symbol indicates that further information on this subject is available in the Operator's Manual of the machine or of the implement in question.

Document structure based on the assembly structure

The chapters of the present manual are subdivided into assemblies as far as contents permit. The structure of these assemblies is the same in all chapters.

Different product groups have different assembly structures. CLAAS makes every effort to keep this assembly structures identical in any document.

Search and find

Due to the constantly recurring assembly structure, the subject in question can be quickly found using the table of contents or the header of this manual.

In addition, the index provided in this manual is a useful tool for locating a subject. The index can be found on the last pages of this manual.

Directions

Front, rear, right and left refer to the direction of forward travel. If necessary, a direction arrow is used for indicating the direction of travel in figures.

Abbreviations

Abbreviation	Description
bar	bar (unit for pressure)
approx.	approximately
cm	Centimetre
DIN	German Standardization Institute
EC	European Community
EN	European Standard
GPS	Satellite navigation system
h	Hours
Ident no.	Identification number of machine
ISO	International Standardization Organisation
kg	Kilogram
kPa	Kilopascal
km	Kilometre
km/h	Kilometres per hour
m	Metre
mm	Millimetre
Nm	Newtonmetre
psi	pound per square inch
StVZO	German Regulations Authorizing the Use of Vehicles for Road Traffic
e.g.	for instance
%	percent
°C	degrees Celsius (unit for temperature)

Technical terms

Technical term	Description
recycle	Re-use of used, defective or no longer required products
Season	Recurring periods of a year
Ignition TDC	Ignition top dead centre (diesel engine piston position)
Overlap TDC	Valve overlap top dead centre (diesel engine piston position)
BDC	Bottom dead centre (diesel engine piston position)

Your CLAAS Service Department

General repair instructions

123153-003

Technical specifications

Technical specifications, dimensions and weights are non-binding. Changes reflecting the technical development and errors reserved.

123192-004

Information on technically correct repairs

- ▶ Ensure cleanliness of installation surroundings and of components in order to avoid damage due to soiling.
- ▶ Mark rotating machine components before removing or dismantling them in order to ensure well-balanced component seating on the correct side after refitting.
- ▶ The slots of expansion pins must always point to the loaded side.
When they are installed with a **90°** twist, they come loose, fall out or shear off.
- ▶ Replace cotter pins, locking wires, sheet retention devices, lock washers and spring washers in the repair process.
- ▶ Align sprockets and V-belt pulleys with one another.
- ▶ Observe the information in the hydraulic system chapter when working on the hydraulic system.
- ▶ Do not mix different oil grades.

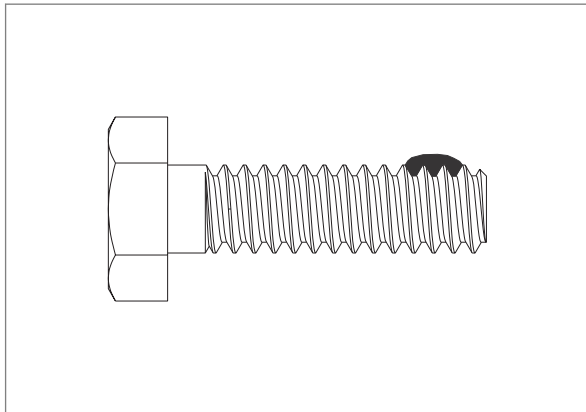
123164-004

Self-locking bolts

Self-locking bolts must not come in contact with sealing compound.

- ▶ Tighten self-locking bolt speedily up to the specified torque.
 - ▶ The full hardening time can be reduced by heating-up, e.g. to **15 minutes** at **+ 70 °C**.
 - ▶ The full load capacity is achieved after **24 hours** at **+ 20 °C**.
- ▶ When unscrewing self-locking bolts, unscrew them quickly.

Liquid locking compound



151599-001

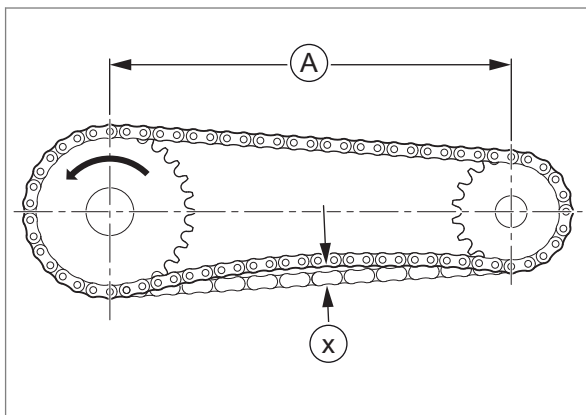
1

- ▶ Use liquid locking compound (glue) only at the spots described in the Repair Manual.
- ▶ The surfaces to be joined must be absolutely clean and free of grease.
 - ▶ A suitable cleaner and an activator possibly delivered along with the glue can be used for cleaning.
- ▶ No cleaner residues may remain on the surfaces to be joined. This applies in particular to tapped holes with a bottom.
 - ▶ Let the surfaces dry well before applying the glue.
- ▶ Apply the glue only in the areas shown in the figure if possible. When applying the glue at an unfavourable spot or when applying too much glue, the joint may tear off when loosening.
- ▶ Observe the glue producer's instructions for use and application!

A joint secured by liquid locking compound can be loosened by heating up to approx. 200 °C.

120771-004

Steel roller chains



13827-006

2

Tensioning

Checking the tension of steel roller chains:

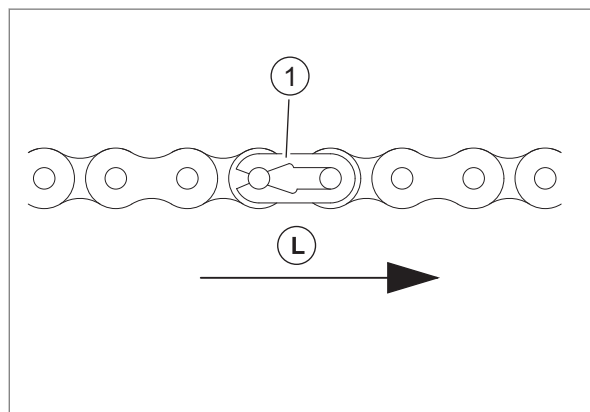
- ▶ Apply a small load to the tight span.
- ▶ Push down the slack span in the middle between the sprockets with your thumb.

You should be able to push down the slack span around 2 % of the spacing between the axles.

Example:

Axle spacing (A) = **500 mm**

Pushing distance (x) of slack span = approx. **10 mm**



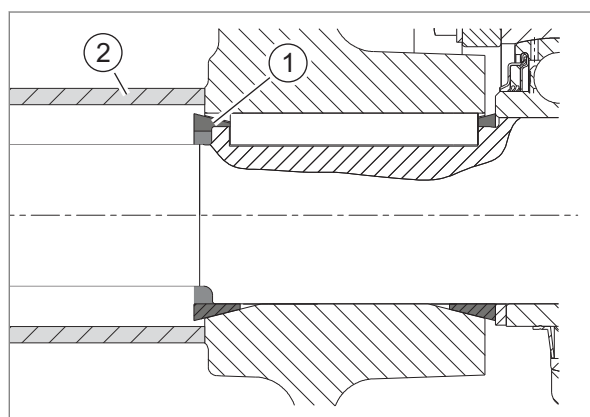
123668-001

3

Chain connector

- ▶ The closed side of chain connector (1) must point in running direction (L)!

Taper ring fasteners

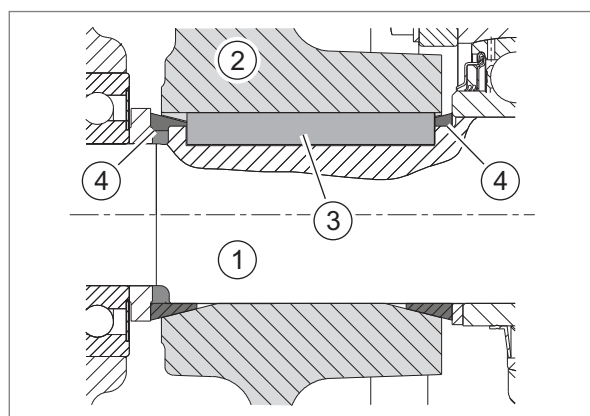


154769-001

4

Dismounting

- ▶ Slacken off tapered ring (1) with a blow.
 - ▶ Use an auxiliary tool (2) if required.



154486-001

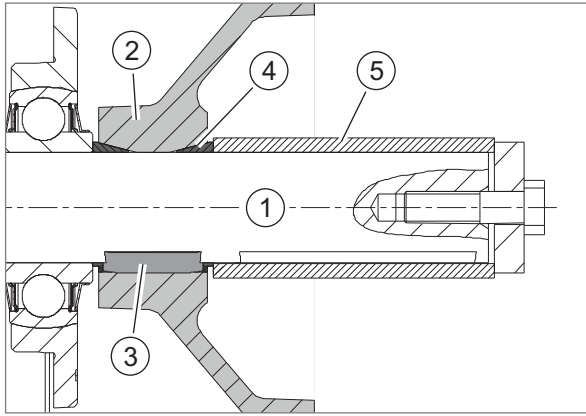
5

Installing

13975-003

NOTICE! Sticking together at the taper ring fasteners. The joint cannot be loosened or comes off only with difficulty.

- ▶ Do not install parts with tough grease.
- ▶ Clean the shaft (1), hub (2), parallel key (3) and taper ring (4) thoroughly and coat them with grease as specified in the Operator's Manual.
- ▶ Tighten to the specified torque.
 - ▶ In case of several taper ring fasteners fitted behind one another, tighten those separately.
 - ▶ Use an auxiliary tool (5) if required.

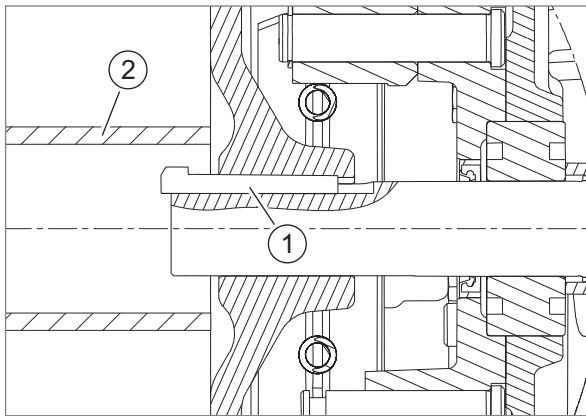


154768-001

6

Gib head key joints

123163-004

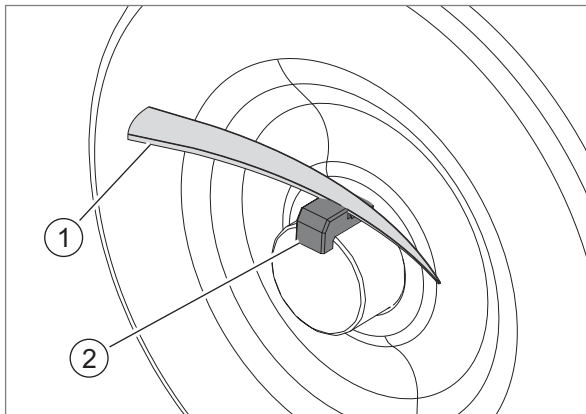


154811-001

7

Dismounting

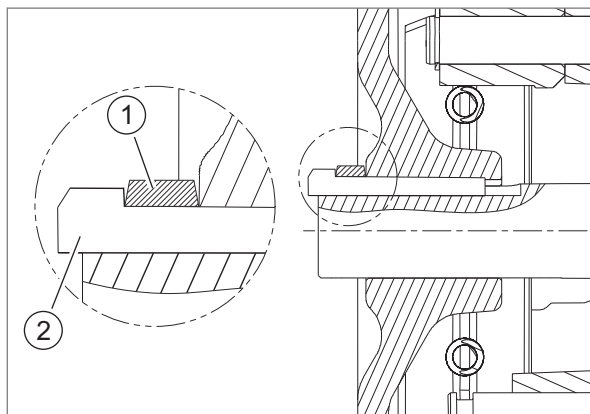
- ▶ Slacken off gib head key (1) with a blow if possible.
- ▶ Use an auxiliary tool (2) if required.



154813-001

8

- ▶ Drive out the gib head key (2) with a key drawer (1).
- ▶ Ensure that the key drawer is used as shown in the figure.



154812-001

9

Installation

The gib head key (1) comes in raw condition as a spare part and must be machined to suit the application by milling or grinding.

- ▶ Grind the gib head key (1) to suit the application at surface (2).
 - ▶ Surface (3) must **not** be machined.
- ▶ Clean shaft, hub and keyway to be free of grease, paint and rust prior to assembly.

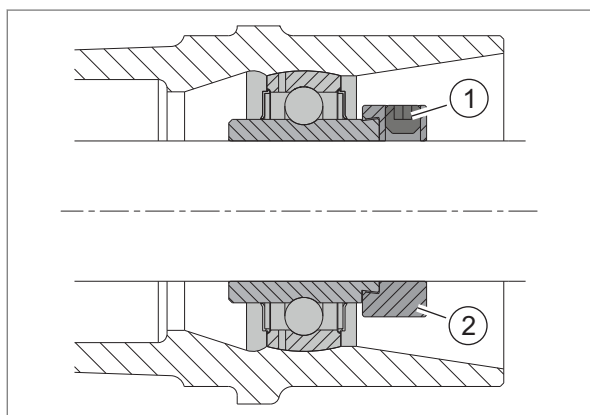
85675-003

NOTICE! Excessive force employed when installing the gib head key. Damage to the gib head key joint. The gib head key cannot be removed any more.

- ▶ Drive in the gib head key carefully with a suitable and not too heavy hammer.
- 10 ▶ Ensure that the gib head key is driven in only so far that it can still be removed without problems, using a key extractor.

123167-003

Lock collar bearing

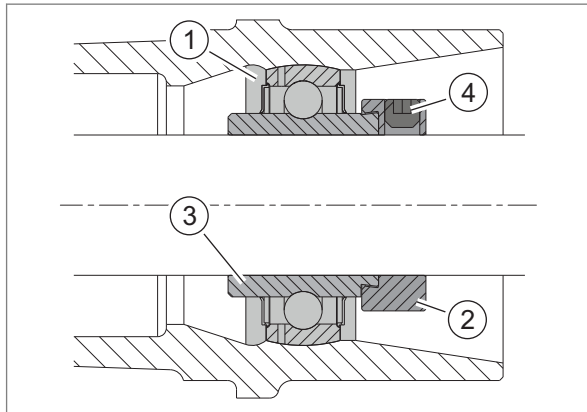


154814-001

11

Dismounting

- ▶ Slacken off set screw (1).
- ▶ Drive off eccentric ring (2) against the shaft's sense of rotation.
- ▶ Remove bearing.



154500-001

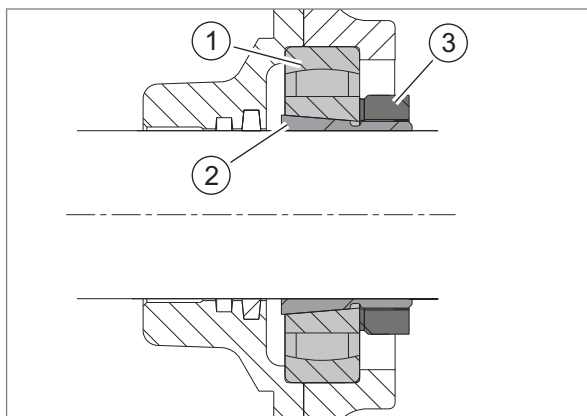
12

Installing

- ▶ Tighten lock collar bearing (1) on the shaft by twisting eccentric ring (2) over the bearing inner race (3).
- ▶ Arrest the eccentric ring with moderate force in the sense of rotation of the shaft.
- ▶ To make dismounting easier, the inner ring and the shaft can be coated with grease as specified in the Operator's Manual.
- ▶ Tighten set screw (4).

120831-003

Adapter sleeve bearings

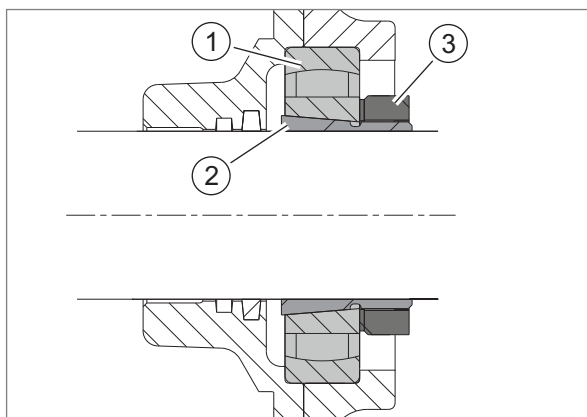


154510-001

13

Dismounting

- ▶ Loosen the tab of sleeve nut (3).
- ▶ Slacken off sleeve nut by some turns only.
 - ▶ Ensure that the thread is still completely engaged.
- ▶ Slacken off expansion pin (2) with a firm blow.
- ▶ Pull off adapter sleeve bearing (1) completely.



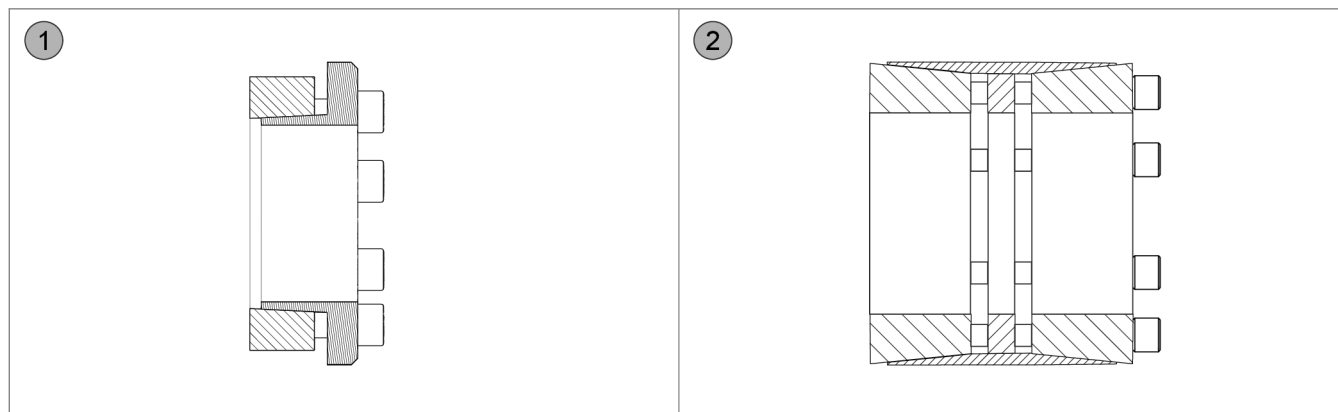
154510-001

14

Installation

- ▶ Clean expansion pin (2) and shaft and check easy movement of the sleeve nut (3).
- ▶ Install adapter sleeve bearing (1) according to the conical inside ring (2).
- ▶ Tighten the sleeve nut with the suitable special tool and to the prescribed torque.
- ▶ Continue tightening the sleeve nut to the specified degrees.
- ▶ Tighten sleeve nut until the nearest tab can be applied.
- ▶ Secure sleeve nut with the tab.

Chuck bushing



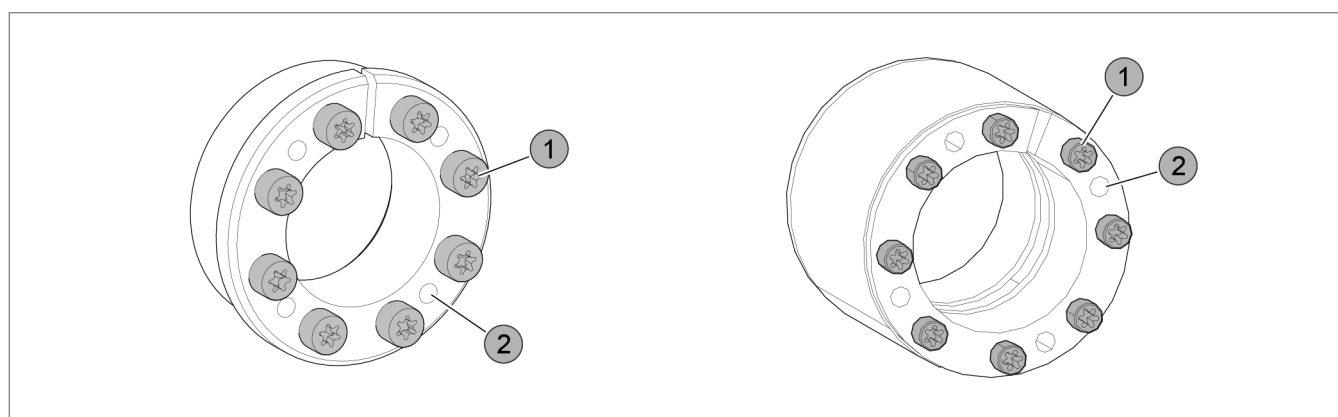
275616-001

15

Possible versions of chuck bushings:

- ▶ Version (1): two-piece chuck bushing
- ▶ Version (2): four-piece chuck bushing

Dismounting



275615-001

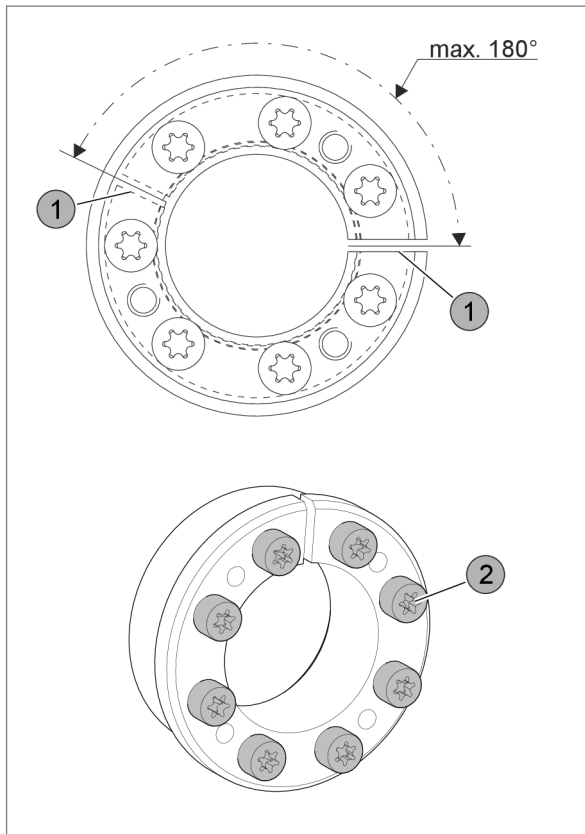
16

- ▶ Unscrew bolts (1).
- ▶ Screw in bolts (1), or longer bolts if required at (2).
 - ▶ Screw in bolts until the chuck bushing comes loose.
 - ▶ Apply a little oil to bushing if necessary.
- ▶ Remove the chuck bushing if required.

Installation

The installation method of the two chuck bushings differs.

- ▶ To ensure correct function of the chuck bushing, follow the installation method of the chuck bushing in question precisely.

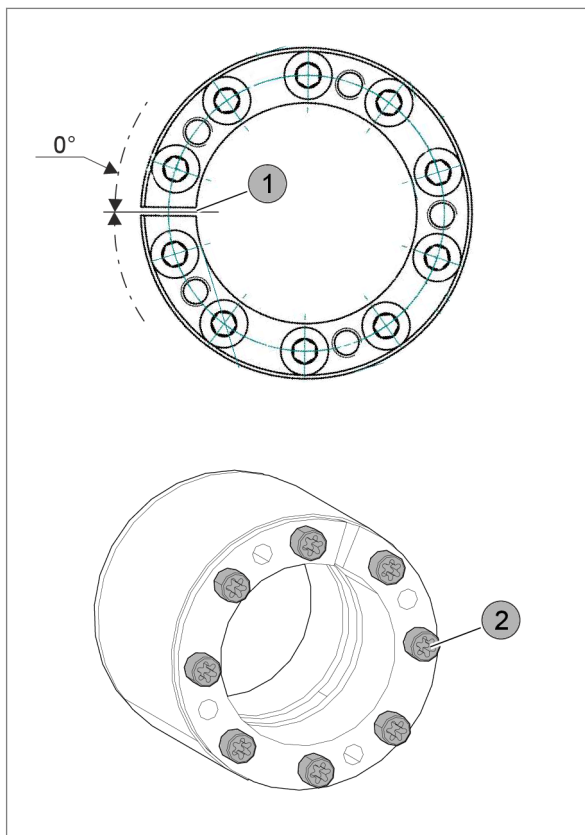


275617-001

17

Chuck bushing version (1)

- ▶ Clean the chuck bushing and the shaft thoroughly.
- ▶ Insert chuck bushing.
 - ▶ Ensure that slots (1) are installed with the **largest angular offset possible**.
- ▶ Tighten bolts (2) evenly crosswise in **three** steps.
 - ▶ Observe the specified torques of the respective steps.



275619-001

18

Chuck bushing version (2)

- ▶ Clean the chuck bushing and the shaft thoroughly.
- ▶ Insert chuck bushing.
 - ▶ Ensure that slots (1) are installed **without angular offset**.
- ▶ Tighten bolts (2) evenly crosswise in **three** steps.
 - ▶ Observe the specified torques of the respective steps.

Circlips

NOTICE

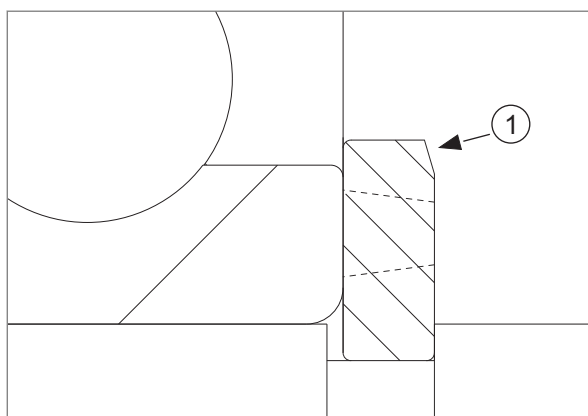
Overspreading the circlip.

Plastic material deformation.

No safe fixing of component.

- ▶ Spread circlip only as far as needed for installation and dismantling.
- ▶ Do not use any circlip already overspread before.

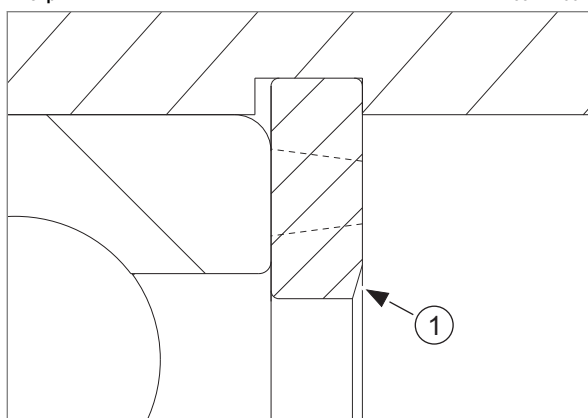
- ▶ Insert circlips as shown in the figures.
 - ▶ Ensure that chamfer (1) does **not** make contact with the component to be secured.
 - ▶ If required, make circlip engage with a slight blow.



Circlip DIN 471

155144-001

19

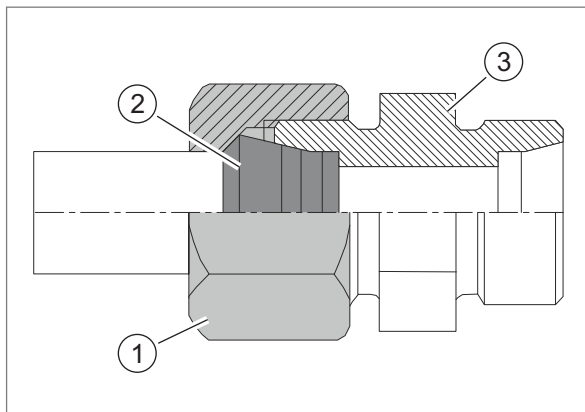


Circlip DIN 472

155145-001

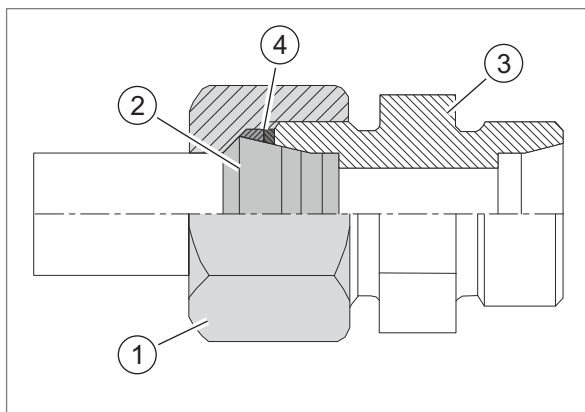
20

Ferrule fittings



Ferrule without seal

154515-001



Ferrule with seal

154516-001

Screwing in

- ▶ Cut off the corresponding tube at right angles.
 - ▶ Do not use a pipe cutter.

In case of pipe bends, the straight pipe end up to where the bending radius starts must be at least twice the height of the union nut.

- ▶ Slightly deburr the pipe end on the inside and outside.
 - ▶ Do not chamfer the pipe end.

- ▶ Clean the pipe end.

- ▶ Push the union nut (1) and the ferrule (2) on the pipe.

- 21** ▶ Push the pipe against the stop in the connector (3) and tighten the union nut until the ferrule seizes the pipe.

This pressure point can be felt because increased power is needed from here.

The pipe must be fixed securely during assembly and must not rotate.

- ▶ Tighten the union nut by half a rotation beyond the first pressure point.

- ▶ Check the incision at the cutting edge.

A visible collar must fill the space ahead of the ferrule face end.

The ferrule may rotate, but axial displacement must not be possible.

- 22** ▶ Insert the pre-assembled pipe into the well-oiled threaded joint.

- ▶ Screw on the union nut until the power needed to do this clearly increases.

- ▶ After that, continue to screw the union nut on for half a turn beyond that point.

- ▶ Observe the tightening torques. [Page 24](#)

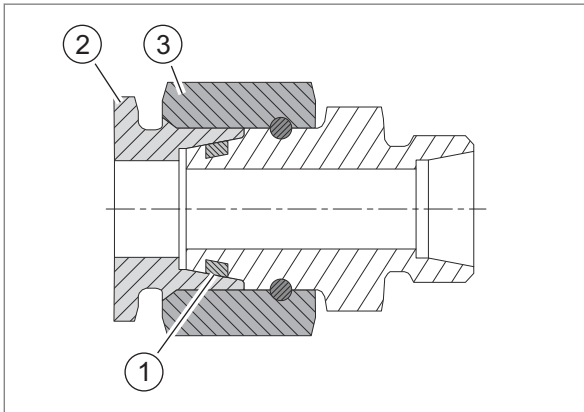
Non-tight ferrule connection

- ▶ If a connection leaks, loosen the union nut until some oil escapes.

- ▶ Then tighten according to instructions.


- ▶ Replace the seal (4) if required.

Sealing cone fittings



154527-001

23

- ▶ Apply seal (1) on the sealing cone (2).
- ▶ Tighten the union nut (3) a third of a turn beyond the point where resistance is felt.
 - ▶ Observe the tightening torques!  [Page 25](#)

Hydraulic hoses

120856-008

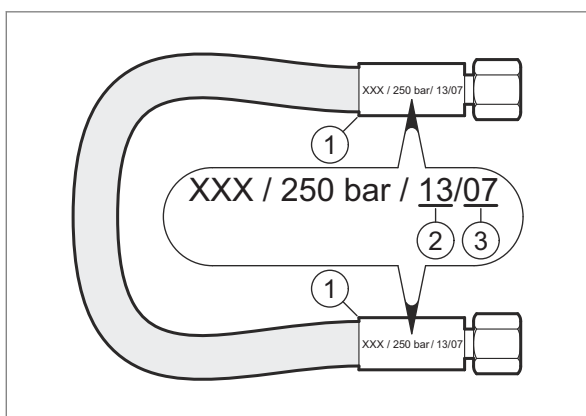
124582-004

CAUTION

Hydraulic hoses may become leaky due to damage and ageing. This may make machine parts drop unintendedly and injure persons.

- ▶ Have damaged hydraulic hoses replaced immediately by a qualified specialist workshop.
- ▶ Have hydraulic hoses replaced by a qualified specialist workshop 6 years after production at the latest.

To facilitate identifying of hydraulic hoses, each hose has the CLAAS part number printed on it.



40202-004

24

- ▶ Check hydraulic lines prior to putting into operation for the first time and then at least once a year.
- ▶ Replace the hydraulic hoses when damage or ageing appears.

The date of manufacture can be identified on the hose fitting (1).

(2) = Year (e.g. 12 = 2012)

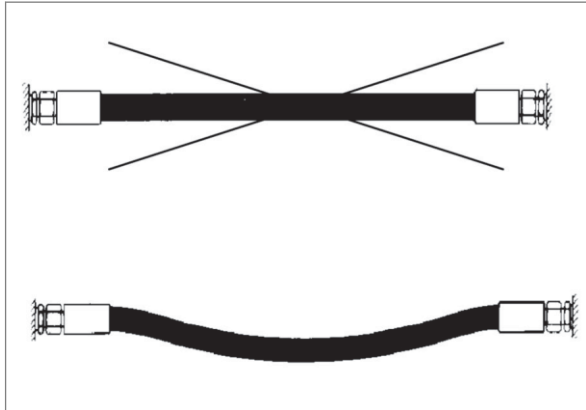
(3) = Month (e.g. 07 = July)

Laying of hoses

13989-003

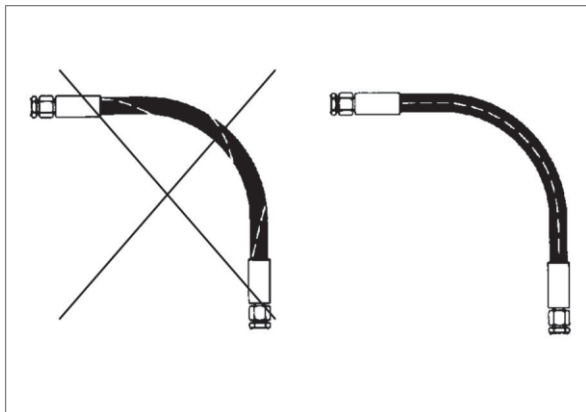
NOTICE! Hoses laid in a straight line get shorter as the hydraulic pressure is built up. Valves may be torn off.

- ▶ Always install hoses with a slight slack.
- ▶ Install hoses so that no tension or compression loads will occur in any operating conditions.
 - ▶ Check: When moving the hose to either side at the centre between two fixing/joining elements (e.g. clamps), the entire play of the hose is to be 1 cm min.



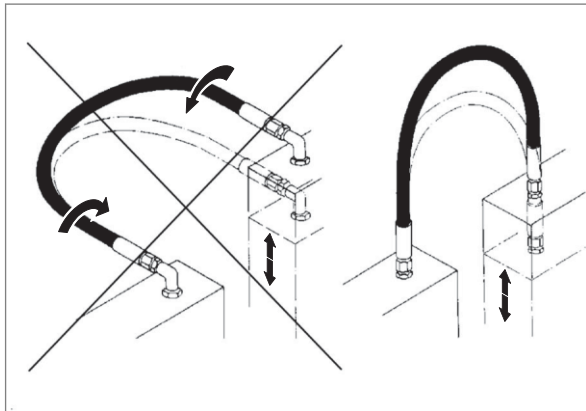
5727-002

25



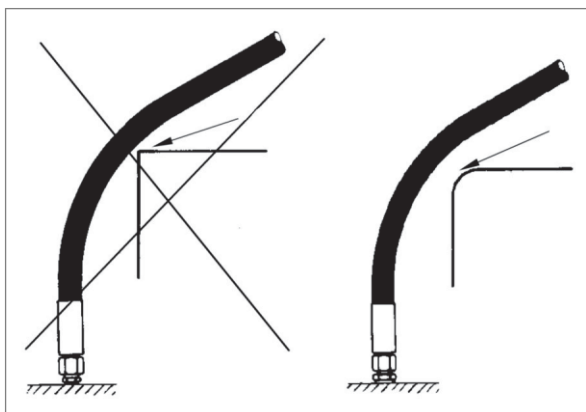
5728-002

26



5729-002

27

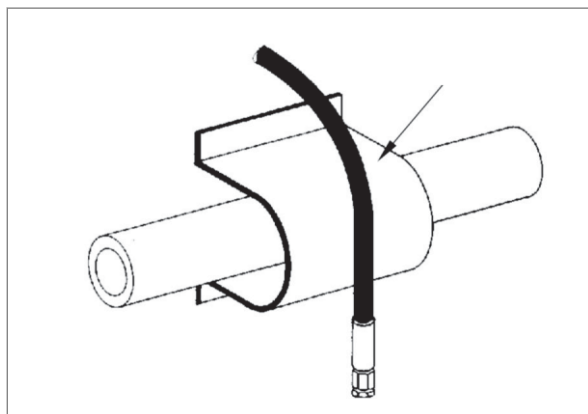


5726-002

28

- ▶ Do not install a hose with a twist.
 - ▶ In particular not if the hose is subject to movement.

- ▶ Avoid external mechanical impacts on hoses.
 - ▶ Avoid chafing of hoses on one another or on components by useful arrangement and fastening.
 - ▶ Keep an adequate distance from components.
 - ▶ Cover up sharp-edged components permanently.
- ▶ When high outside temperatures are involved, install hoses at a sufficient distance from components radiating heat.
 - ▶ If necessary, protect hose by a protective guard.



29

5730-002

157962-002

Treatment of sealing faces

Close all oil, coolant and fuel bores thoroughly prior to treating the sealing faces.

Ensure that when treating sealing faces of components containing oil, coolant and fuel, no abrasives are used. Loose particles cause pollution and damage.

Ensure that no seal residues, rust, lime and combustion residues end up in open components (gearbox halves).

Remove sealing residues, rust, lime and combustion residues only using scraping tools or cleaning agents.

123155-004

Spare parts

11210-003

⚠ WARNING

Use of unauthorised spare parts.

Death or serious injury.

- ▶ Spare parts must at least comply with the technical standards required by the manufacturer of the implement!
- ▶ We recommend using genuine CLAAS spare parts.

- ▶ Please quote the machine identification number when ordering spare parts or making technical enquiries.

CLAAS will assume no liability whatsoever for damage incurred as a result of the use of non-genuine CLAAS parts, accessories, and ancillary equipment.